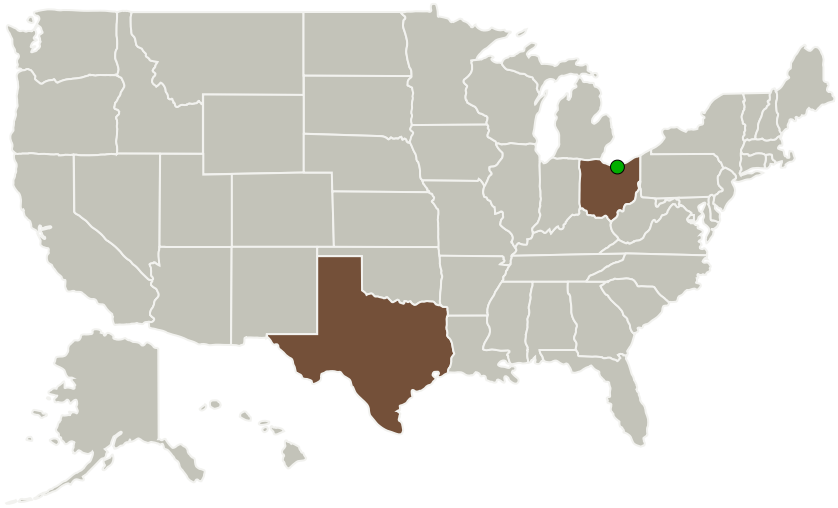
Multi-Purpose X-ray System, Phase I

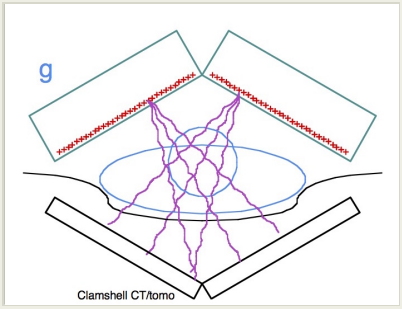
Completed Technology Project (2016 - 2016)

Project Introduction

Stellarray proposes the development of a highly novel Multi-Purpose X-ray Source and System (MPXS), for use on flight missions, space stations, planetary excursions and planetary or asteroid bases, to meet nearly all NASA imaging needs as detailed in the Exploration Medical Condition List (EMCL). This proposal goes far beyond an incremental increase in imaging capability and offers a path towards providing the full range of radiographic imaging - 2D, digital tomosynthesis and even half (180?) or full (360?) computed tomography (CT) ? to cover routine and emergency imaging needs in space mission environments. The source is comprised of sections, each designed for a specific range of x-ray imaging or analysis functions. In the starting design, each section is close to one of the sidewalls of the source, which is shaped as a rectangular box and made primarily of aluminum nitride ceramic (AlN) sheets. Each AlN sidewall has a window that allows the x-ray flux to exit the source. The window can be a hollowed out section of the sidewall or a thin strip of low Z material (glass, BeO, etc) fritted, fused or brazed into or over a window aperture in the sidewall. Thin strips of metal can be placed over the windows for beam filtration. Each window will output flux from one or more rows of spots (x-ray pixels, or xels) on the metal anode inside. Systems comprise one or more of these sources and flat panel x-ray detectors, with several system modes configurable using the same source and detector.

Primary U.S. Work Locations and Key Partners





Multi-Purpose X-ray System, Phase I

Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

Multi-Purpose X-ray System, Phase I

Completed Technology Project (2016 - 2016)

Organizations Performing Work	Role	Type	Location
Stellarray, Inc.	Lead Organization	Industry	Austin, Texas
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Ohio	Texas

Project Transitions

June 2016: Project Start

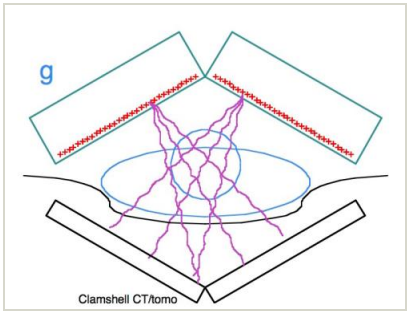
December 2016: Closed out

Closeout Summary: Multi-Purpose X-ray System, Phase I Project Image

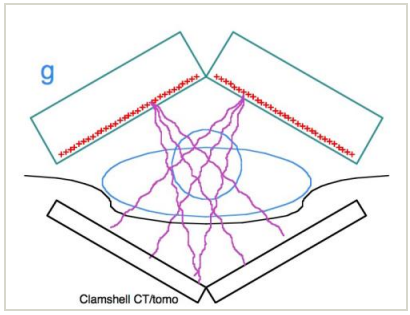
Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139814)*

Images



Briefing Chart Image
Multi-Purpose X-ray System, Phase I
(https://techport.nasa.gov/image/127779)



Final Summary Chart Image
Multi-Purpose X-ray System, Phase I Project Image
(https://techport.nasa.gov/image/129437)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Stellarray, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

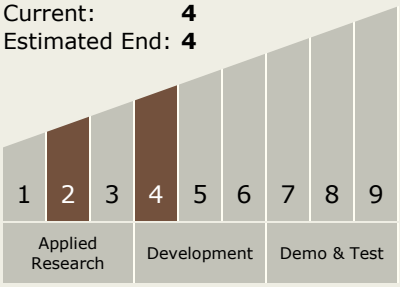
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Ronald Hellmer

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Multi-Purpose X-ray System, Phase I

Completed Technology Project (2016 - 2016)

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.1 Medical Diagnosis and Prognosis

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System